AMENDMENTS TO THE CLAIMS

This is a complete and current listing of the claims, marked with status identifiers in parentheses. The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Original) A liquid crystal display device, comprising:

a liquid crystal panel including a liquid crystal layer and an electrode for applying a voltage to the liquid crystal layer; and

a driving circuit for supplying a driving voltage to the liquid crystal panel, wherein

the liquid crystal panel exhibits, in its voltage-transmittance characteristics, an extreme transmittance at a voltage equal to or lower than a lowest gray-level voltage, and the driving circuit supplies to the liquid crystal panel a predetermined driving voltage overshooting a gray-level voltage corresponding to an input image signal of a current vertical period, according to a combination of an input image signal of an immediately preceding vertical period and the input image signal of the current vertical period.

2. (Original) The liquid crystal display device according to claim 1, wherein a difference in retardation of the liquid crystal panel between a state where a voltage is not applied and a state where a highest gray-level voltage is applied is 300 nm or more.

3. (Original) The liquid crystal display device according to claim 1, wherein the liquid crystal panel is a transmission-type liquid crystal panel, and the extreme transmittance provides a maximum transmittance.

4. (Original) The liquid crystal display device according to claim 1, wherein a signal vertical period of the input image signal corresponds to a single frame, at least two fields of the driving voltage correspond to a single frame of the input image signal, and the driving circuit supplies, at least in a first field of the driving voltage, a driving voltage overshooting a gray-level voltage corresponding to an input image signal of a current field to the liquid crystal panel.

5. (Original) The liquid crystal display device according to claim 1, wherein the liquid crystal layer is a homogeneous-orientation liquid crystal layer.

6. (Original) The liquid crystal display device according to claim 1, wherein the liquid crystal panel further includes a phase compensator, three principal refractive indices na, nb and nc of an index ellipsoid of the phase compensator have a relation of na=nb > nc, and the phase compensator is arranged so as to cancel at least a part of retardation of the liquid crystal layer.

7. (Original) A liquid crystal display device, comprising:

a liquid crystal panel including a plurality of picture-element capacitors arranged in a matrix, and thin film transistors respectively electrically connected to the plurality of picture-element capacitors; and

a driving circuit for supplying a driving voltage to the liquid crystal panel, wherein

the liquid crystal display device updates display every vertical period by rendering the plurality of picture-element capacitors in a charged state corresponding to the input image signal.

each of the plurality of picture-element capacitors includes a liquid crystal capacitor formed from a corresponding picture-element electrode, a counter electrode and a liquid crystal layer provided between the picture-element electrode and the counter electrode, and

a storage capacitor electrically connected in parallel with the liquid crystal capacitor, a capacitance ratio of the storage capacitor to the liquid crystal capacitor being 1 or more, and

the picture-element capacitor retains 90% or more of a charging voltage over a single vertical period, when at least a highest gray-level voltage is applied.

8. (Original) The liquid crystal display device according to claim 7, wherein the driving circuit supplies to the liquid crystal panel a predetermined driving voltage overshooting a gray-level voltage corresponding to an input image signal of a current vertical period, according to a combination of an input image signal of an immediately

preceding vertical period and the input image signal of the current vertical period.

9. (Original) The liquid crystal display device according to claim 8, wherein, for the input image signal of every gray level, the driving circuit supplies to the liquid crystal panel the driving voltage overshooting the gray-level voltage corresponding to the input image signal of the current vertical period.

10. (Original) The liquid crystal display device according to claim 7, wherein the liquid crystal layer of the liquid crystal panel includes a nematic liquid crystal material having a positive dielectric anisotropy, the liquid crystal layer included in each of the plurality of picture-element capacitors includes first and second regions having different orientation directions, and

the liquid crystal panel further includes a pair of polarizers arranged so as to orthogonally cross each other with the liquid crystal layer interposed therebetween, and a phase compensator for compensating for a refractive index anisotropy of the liquid crystal layer in black display state.

11. (Original) The liquid crystal display device according to claim 7, wherein the liquid crystal layer is a homogeneous-orientation liquid crystal layer.

12. (Original) The liquid crystal display device according to claim 11, wherein the liquid crystal panel further includes a phase compensator, three

principal refractive indices na, nb and nc of an index ellipsoid of the phase compensator have a relation of na = nb > nc, and the phase compensator is arranged so as to cancel at least a part of retardation of the liquid crystal layer.

13. (New) A liquid crystal display device, in which a driving circuit applies a driving voltage to a liquid crystal panel to control the transmittance of the liquid crystal panel for display, wherein:

the liquid crystal panel exhibits, in its voltage-transmittance characteristics, a maximum or minimum transmittance at a voltage lower than a lowest gray-level voltage; and

the driving circuit selectively supplies to the liquid crystal panel as a predetermined driving voltage corresponding to an input image signal of a current vertical period, according to a combination of an input image signal of an immediately preceding vertical period and an input image signal of the current vertical period, at least a gray-level voltage which falls within a range between the lowest gray-level voltage and the highest gray-level voltage, and an overshoot gray-level voltage which is lower than the lowest gray-level voltage.

14. (New) A liquid crystal display device according to claim 13, wherein:

the liquid crystal panel is a normally white mode liquid crystal panel.

15. (New) A liquid crystal display device according to claim 14, wherein

the driving circuit selectively applies the gray-level voltage which falls

within a range between the lowest gray-level voltage and the highest gray-level voltage, the overshoot voltage which is lower than the lowest gray-level voltage, and an overshoot gray-level voltage which is higher than the highest gray-level voltage.

16. (New) A liquid crystal display device according to claim 13, wherein: the liquid crystal panel is a normally black mode liquid crystal panel.

17. (New) A liquid crystal display device according to claim 16, wherein the driving circuit selectively applies the gray-level voltage which falls within a range between the lowest gray-level voltage and the highest gray-level voltage, the overshoot voltage which is lower than the lowest gray-level voltage, and an overshoot gray-level voltage which is higher than the highest gray-level voltage.

18. (New) A liquid crystal display device, comprising:

a liquid crystal panel including a plurality of picture-element capacitors arranged in a matrix, and thin film transistors respectively electrically connected to the plurality of picture-element capacitors; and

means for supplying, to the liquid crystal panel, a driving voltage overshooting a gray-level voltage corresponding to an input image signal of a current vertical period, according to a combination of an input image signal of an immediately preceding vertical period and the input image signal of the current vertical period, wherein

the liquid crystal display device updates display every vertical period by rendering the plurality of picture-element capacitors in a charged state corresponding to the input image signal.

each of the plurality of picture-element capacitors includes a liquid crystal capacitor formed from a corresponding picture-element electrode, a counter electrode and a liquid crystal layer provided between the picture-element electrode and the counter electrode, and

a storage capacitor electrically connected in parallel with the liquid crystal capacitor, a capacitance ratio of the storage capacitor to the liquid crystal capacitor being 1 or more, and

the picture-element capacitor retains 90% or more of a charging voltage over a single vertical period, when at least a highest gray-level voltage is applied.